BIOLOGICAL EVALUATION
REGARDING
EPA APPROVAL
OF
AMENDMENTS BY
NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
TO
"FORMER CLASS WATERS LOCATED IN THE UPPER HUMBOLDT RIVER BASIN"
WATER QUALITY STANDARDS

WITH REGARD TO SPECIES UNDER THE JURISDICTION OF
THE U.S. FISH AND WILDLIFE SERVICE

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I. INTRODUCTION

DESCRIPTION OF THE ACTION

The action that is the subject of this Biological Evaluation is the United States Environmental Protection Agency's (EPA) determination, under §303(c)(3) of the Clean Water Act (CWA), that certain amendments to the aquatic life water quality criteria for certain former "Class Waters" in the Upper Humboldt River Basin, adopted by the Nevada State Environmental Commission on October 8, 2014 meet the requirements of the CWA. The revisions update certain beneficial uses and add criteria to certain waters in the Upper Humboldt River Basin.

A determination that new or revised state water quality standards meet the requirements of the CWA is commonly referred to as "approval", and establishes them as water quality standards for the waters to which they apply. In taking action on a set of new or revised water quality standards, EPA can approve or disapprove the entire set, or approve some individual revisions and disapprove others.

This biological evaluation addresses only the revisions for which EPA has determined that our action "may affect" listed species.

OVERVIEW OF THE WATER QUALITY CRITERIA

The Environmental Protection Agency's authorities under the water quality standards' program are contained in Sections 301, 303, and 304(a) of the Clean Water Act. Section 303 of the CWA mandates that States adopt water quality standards to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. Water quality standards consist of designated uses for specific water bodies and water quality criteria necessary to protect those uses. Water quality criteria may be numeric or narrative.

Under Section 303(c), states must review their applicable water quality standards at least once every three years, adopt new or modified standards as appropriate, and submit such new and/or revised standards to EPA for review. If EPA determines, within 60 days, that the new and/or revised standards do not meet the criteria of the CWA, EPA must, within 90 days of the state's submittal, notify the state of the changes needed. If the state fails to make the necessary changes within 90 days of such notification, EPA must promptly propose appropriate standards for the state. In 2000, the EPA revised its regulation to specify that new and revised standards submitted to EPA after May 30, 2000 do not become effective for Clean Water Act purposes until approved by EPA.

SCOPE AND HISTORY OF THE UPPER HUMBOLDT RIVER BASIN WATER QUALITY CRITERIA

The State of Nevada requirements for setting, reviewing and revising water quality standards are contained in the Nevada Revised Statutes 445A.425, 445A.520 and 445A.565 and water quality standards for waters of Nevada are found in the Nevada Administrative Code (NAC) 445A.118 through 445A.2234. To set water quality standards, water bodies are divided into reaches based on land uses and physical and chemical characteristics. Beneficial uses for each reach are designated and criteria (or beneficial uses standards, BUSs) are usually derived from EPA national guidance criteria. If the existing water quality is significantly better than the BUS, requirements to maintain existing higher water quality (RMHQs) may be established in addition to the BUS. Workshops are held to obtain comments on the proposed water quality standards. After consideration of public comments, the standards are presented at a public hearing to the State Environmental Commission (SEC) for review and adoption. Standards adopted by the SEC are then submitted to EPA for review.

Prior to 2008, many waters in Nevada were categorized by classes based on the degree of anthropogenic impact on the reach. The Upper Humboldt River Basin contained former Class A, B and C waters. In 2008, the State Environmental Commission adopted revisions to the NAC which eliminated the Class waters structure and changed the class waters into waters with designated specific water quality standards for each waterbody reach. There were no changes to the existing beneficial uses or to the numeric criteria at that time except to add criteria for *E. coli* and total ammonia. NDEP is now proposing to update the beneficial uses and numeric criteria for specific former "Class waters" in the Upper Humboldt River Basin.

II. ANALYSIS OF POTENTIAL EFFECTS OF PROPOSED ACTION ON LISTED SPECIES

EPA conducted an evaluation of the potential for adverse effects from the State's proposed adoption of the revisions to the aquatic life water quality criteria for the Upper Humboldt River Basin in Nevada. EPA used all best available scientific and commercial data; the results of this evaluation are analyzed below.

DESCRIPTION OF THE AREA AFFECTED

The Upper Humboldt River Basin in Nevada includes waterbodies located in Elko, Eureka and White Pine Counties. The Basin includes the headwaters, tributaries, and main stem of the Humboldt River downstream to Palisade, Nevada. The specific waters in the Upper Humboldt River Basin that are subject to this ESA analysis include the following:

1. • Humboldt River, North Fork and tributaries at the national forest boundary: From their origin in the Independence Mountain Range to the national forest boundary.
   • Humboldt River, North Fork at Beaver Creek: From the national forest boundary to its confluence with Beaver Creek.
   Both waterbodies/reaches are designated as trout waters.

   The Humboldt River receives most of its flow from tributaries in the upper third of its length. The Upper Humboldt River Basin consists of five sub-basins: Mary's River, Ruby Mountains, North Fork, Maggie and Susie Creeks and the Elko Segment. The North Fork Humboldt River has its origins in tributaries along the north slopes of the Independence Mountain Range. The tributaries come together and flow into the North Fork and exit the mountains to flow approximately 70 miles to the Humboldt River. After exiting the mountains, the North Fork turns southward for approximately 25 miles through Devil's Gap and then to the confluence with Beaver Creek.

2. • Humboldt River, South Fork and tributaries at Lee: From their origin to Lee, except for the lengths within the South Fork Indian Reservation.
   These waterbodies/reaches are designated as trout waters.

   The Humboldt River receives most of its flow from tributaries in the upper third of its length. The Upper Humboldt River Basin consists of five sub-basins: Mary's River, Ruby Mountains, North Fork, Maggie and Susie Creeks and the Elko Segment. The South Fork originates on the west side of the Ruby Mountains in Elko County and drains an area of 99 square miles. The South Fork ultimately merges with Huntington Creek and flows into South Fork Reservoir. The South Fork Dam was built in 1987 and split the South Fork into upper and lower reaches.

3. • Mary's River, upper: From its origin to the point where the river crosses the east line of T42N, R59E
   • Mary's River at the Humboldt River: From the east line of T42N, R59E to its confluence with the Humboldt River.
   These waterbodies/reaches are designated as trout waters.

The Humboldt River receives most of its flow from tributaries in the upper third of its length. The Upper Humboldt River Basin consists of five sub-basins: Mary's River, Ruby Mountains, North Fork, Maggie and Susie Creeks and the Elko Segment. The Mary's River sub-basin is the uppermost source of the Humboldt River and contains the Mary's River. The Mary's River begins approximately 56 miles above its confluence with the Humboldt River. It drains an area with its source waters located in the upper watersheds of the Jarbidge Mountains near Mary's River Peak and Fox Creek Peak.

4. • Maggie Creek Tributaries: From their origin to the point where they become Maggie Creek or the point of their confluence with Maggie Creek.
   • Maggie Creek at Jack Creek: From where it is formed by the Maggie Creek tributaries to its confluence with Jack Creek.
   These waterbodies/reaches are designated as trout waters.

   The Humboldt River receives most of its flow from tributaries in the upper third of its length. The Upper Humboldt River Basin consists of five sub-basins: Mary's River, Ruby Mountains, North Fork, Maggie and Susie Creeks and the Elko Segment. Maggie Creek headwaters originate between the eastern slopes of the Tuscarora Mountains and the western slopes of the Independence Mountains. Maggie Creek drains an area of nearly 620 square miles. Maggie Creek runs through the Carlin Trend, an area containing extensive gold ore deposits and flows into the Humboldt River near the town of Carlin.

5. • Green Mountain Creek at Toyn Creek: From its origin to its confluence with Toyn Creek.
   This waterbody/reach is designated as trout water.

   Green Mountain Creek and South Fork Green Mountain Creek both originate in the Ruby mountains and flow west to their confluence and then into Toyn Creek. Toyn Creek flows northwest to join with Corral Creek and on into Smith Creek. Smith Creek flows into Huntington Creek, a major tributary to the South Fork Humboldt River.

INFORMATION USED IN THE ANALYSIS

SPECIES LIST

EPA reviewed the U.S. Fish and Wildlife Service's Information, Planning and Conservation System to identify a list of protected species in the affected waters of the Upper Humboldt River Basin. A description of each federally listed aquatic animal species, subspecies, or evolutionarily significant unit in the Upper Humboldt River Basin tributaries potentially affected by promulgation of revised aquatic life

criteria is provided below. This list includes all fish, picivorous wildlife species and all aquatic invertebrate species. As aquatic animal species, these species are the ones that the revised criteria are primarily designed to protect.

Listed species

Fish

Lahontan cutthroat trout, *Oncorhynchus clarkia henshawi* (T)

SPECIES DESCRIPTIONS

Lahontan cutthroat trout, *Oncorhynchus clarkia henshawi,* (T)

Status

The Lahontan cutthroat trout (LCT) was federally listed as an endangered species in 1970 (35 FR 13520). It was reclassified as a threatened species in 1975 to facilitate management and allow regulated angling (40 FR 29864). A Recovery Plan for the Lahontan cutthroat trout was completed in 1995 (Recovery Plan for the Lahontan Cutthroat Trout, USFWS, 1995).

Life History

The Lahontan cutthroat trout (LCT) is an inland subspecies of cutthroat trout. It is endemic to the physiographic Lahontan basin of northern Nevada, eastern California and southern Oregon. Three characters which separate LCT from other subspecies of cutthroat trout have been identified. The pattern of medium to large, rounded spots, somewhat evenly distributed over the sides of the body, head, and abdomen is the first character. Second, LCT have the highest number of gillrakers found in any trout. Last, Lahontan cutthroat trout have a high number of pyloric caeca (USFWS, 1995).

The Lahontan cutthroat trout is an obligatory stream spawner, typical of cutthroat trout subspecies (73 FR 522257). Spawning occurs from April through June. Timing depends on stream flow, elevation, and water temperature. Spawning behavior is similar to other stream spawning trout, over gravel substrates. The fish pair up, display courtship, lay eggs in redds dug by females and chase intruders away from the nest. Consecutive year spawning is uncommon (USFWS, 1995).

The Lahontan cutthroat trout eggs usually hatch in 4-6 weeks depending on water temperature and the fry emerge 13-23 days later. Fry movement is density dependent and correlated with fall and winter freshets. Females mature at 3-4 years and males at 2-3 years (USFWS, 1995).

Lahontan cutthroat trout that are stream residents are opportunistic feeders. Their diets consist of drift organisms such as terrestrial and aquatic insects (USFWS, 1995).

The growth rate of Lahontan cutthroat trout is variable with faster growth occurring in larger, warmer waters. Stream dwelling trout have a fairly slow growth rate and are usually less than 5 years old (USFWS, 1995).

Critical Habitat/Historical Distribution and Abundance

The Lahontan cutthroat trout (LCT) were once widely distributed throughout the basin of Pleistocene Lake Lahontan. Lake Lahontan once covered about 8,500 square miles. Lake Lahontan fluctuated widely until about 12,000 years ago when it dropped dramatically in response to climate changes. Fluctuating water depths and the last desiccation of Pleistocene lakes within the Great Basin created a series of unique evolutionary characteristics in the indigenous fish fauna.

Lahontan cutthroat trout historically occupied large freshwater and alkaline lakes, small mountain streams and lakes, small tributary streams and major rivers of the Lahontan Basin of northern Nevada, eastern California and southern Oregon, including the Truckee, Carson, Walker, Susan, Humboldt, Quinn, Summit Lake/Black Rock desert and Coyote Lake watersheds (USFWS, 2009a).

Lahontan cutthroat trout currently occupy approximately 587.7 miles or 8.6 % of streams in 16 different hydrologic units within their historical range. Within the Humboldt River Basin, LCT currently occupy 297 miles or 7.9% of their historical range (USFWS, 2009a).

Nonnative fish occupy nearly all unoccupied LCT historical habitat, making repatriation of LCT extremely difficult. In 2002, a temporary barrier was built below the confluence of the North Fork and South Fork of Green Mountain Creek and both forks were treated with rotenone to eradicate brook trout in 2003 (USFWS, 2009a). This treatment created approximately 11 miles of habitat in the two forks of Green Mountain Creek.

Several major tributaries to the Humboldt River have large permanent barriers constructed or planned near their confluences with the Humboldt River to keep nonnative fishes from invading. This includes the Maggie Creek barrier (2009) which will protect approximately 50 miles of occupied habitat. Three occupied tributaries to Maggie Creek had impassable culverts. The Bureau of Land Management and partners replaced the culverts with bridges which allowed for approximately 50 miles of seasonal connectivity between these tributaries and the mainstem of Maggie Creek (USFWS, 2009a).

A barrier removal project on Gance Creek within the North Fork Humboldt River watershed was implemented by the U.S. Forest Service in 2007. An undersized culvert was replaced with a bottomless arch culvert which allowed LCT to access another 2.8 miles of habitat (USFWS, 2009a).

Threats

The Lahontan cutthroat trout (LCT) are well adapted to diverse natural habitats and harsh physical environment. It is less able to cope with current impacts described below. Past major impacts to LCT include: reduction and alteration of stream discharge; alteration of stream channels and morphology; degradation of water quality; reduction of lake levels and concentrated chemical components in natural lakes and; introductions of nonnative species (USFWS, 1995).

LCT populations have been and continue to be impacted by interactions with nonnative species, habitat fragmentation and isolation, poor habitat condition due to various land use practices, drought, water quality, water management, and fire (USFWS, 2009a).

Recovery Plan Recommendations

The various populations of Lahontan cutthroat trout in the basins of former Lake Lahontan are addressed in the Lahontan Cutthroat Trout Recovery Plan (USFWS, 1995). LCT will be considered for delisting when management has been instituted to enhance and protect habitat required to sustain appropriate numbers of viable, self-sustaining populations. Recovery objectives protect all existing populations of LCT until research and analysis can validate population requirements by basin.

In 2009, the Service completed a 5 year review of the Lahontan cutthroat trout (USFWS, 2009a). The conclusion was that LCT still meet the definition of threatened throughout its range. In 2009, the Service also completed the Spotlight Species Action Plan for the LCT (USFWS, 2009b). The Service determined that the species status was improved. It recommended the following:

1. Continue nonnative fish eradication and reintroduction of LCT into historical waters.
2. Revise the 1995 LCT Recovery Plan.
3. Develop and implement an interagency LCT hatchery management plan.
4. Improve LCT database for future status reviews and recovery effectiveness monitoring.
5. Adapt State and Tribal harvest regulations to conserve LCT

DESCRIPTION OF HOW THE ACTIONS MAY AFFECT LISTED SPECIES OR CRITICAL HABITAT

This section discusses the individual component amendments of which EPA will take action.

1. Add a nitrite criterion of Single Value (SV) $\leq$ .06 mg/l for trout waters.

EPA finds that the proposed nitrite beneficial use criterion is based on sound science and will protect the designated aquatic life beneficial use. The Quality Criteria for Water, Gold Book (USEPA, 1986) recommends a nitrite concentration of ≤ 0.06 mg/l for protection of cold water fish, the most sensitive use. This should be protective of Lahontan cutthroat trout (a cold water fish).

EPA concludes that adoption of the nitrite beneficial use criterion **may affect, but is not likely to adversely affect** Lahontan cutthroat trout. EPA anticipates that the nitrite criterion will provide adequate protection of aquatic life as stated in the Quality Criteria for Water, Gold Book (USEPA, 1986).

2. Add an alkalinity criterion of Single Value (SV) ≥ 20 mg/l.

   EPA finds that the proposed alkalinity beneficial use criterion is based on sound science and will protect the designated aquatic life beneficial use. The Quality Criteria for Water, Gold Book (USEPA, 1986) recommends an alkalinity criterion of 20 mg/l or more as $CaCO_3$ freshwater aquatic life except where natural concentrations are less. Alkalinity is important for fish and other aquatic life in freshwater systems because it butters pH changes that occur naturally as a result of photosynthetic activity of the chlorophyll-bearing vegetation. This should be protective of Lahontan cutthroat trout.

   EPA concludes that adoption of the alkalinity beneficial use criterion **may affect, but is not likely to adversely affect** Lahontan cutthroat trout. EPA anticipates that the alkalinity criterion will provide adequate protection of aquatic life as stated in the Quality Criteria for Water, Gold Book (USEPA, 1986).

3. Add a Total Suspended Solids (TSS) criterion of Single Value (SV) ≤ 25 mg/l for trout waters.

   EPA finds that the proposed TSS beneficial use criterion is based on sound science and will protect the designated aquatic life beneficial use. EPA recommends a suspended solids concentration of between 25 and 80 mg/l to maintain good to moderate fisheries (USEPA, 1972). Settleable materials can blanket the bottom of waterbodies and damage invertebrate populations, clog gravels used for spawning, and if the material is organic, when it decomposes will deplete dissolved oxygen. Suspended materials can also reduce light penetration, thereby limiting primary productivity and decreasing algal production (USEPA, 1986). The proposed trout beneficial use criterion is at the lower limit of the range recommended for protection of aquatic life. This should be protective of Lahontan cutthroat trout.

   EPA concludes that adoption of the TSS beneficial use criterion for trout **may affect, but is not likely to adversely affect** Lahontan cutthroat trout. EPA anticipates that

the TSS criterion will provide adequate protection of aquatic life as stated in the Quality Criteria for Water, Gold Book (USEPA, 1986).

4. Add a turbidity criteria of Single Value ≤ 10 NTUs for trout waters.

   EPA finds that the proposed turbidity beneficial use criterion is based on sound science and will protect the designated aquatic life beneficial use. The 1968 Report of the Commission on Water Quality Criteria (FWPCA, 1968) recommended a turbidity value of 10 NTU for protection of cold water aquatic life. This level is to protect against sediment filling interstices between gravel and stones which eliminates the spawning grounds of fish and the habitat of many aquatic insects and other invertebrate animals such as mollusks, crayfish, fresh water shrimp, etc. This should be protective of Lahontan cutthroat trout.

   EPA concludes that adoption of the turbidity beneficial use criterion for trout **may affect, but is not likely to adversely affect** Lahontan cutthroat trout. EPA anticipates that the turbidity criterion will provide adequate protection of cold water aquatic life as stated in the 1968 Report of the Commission on Water Quality Criteria (FWPCA, 1968).

5. Add chloride criteria of 1 hour average ≤ 860 mg/l and a 96 hour average ≤ 230 mg/l (One-hour and 96-hour average concentration limits may be exceeded only once every 3 years).

   EPA finds that the proposed chloride criteria are based on recent research and data and will protect the beneficial uses. The 1988 Ambient Water Quality Criteria for Chloride (USEPA, 1988) recommends the four-day average concentration of dissolved chloride, when associated with sodium, should not exceed 230 mg/l more than once every three years and the one-hour average concentration should not exceed 860 mg/l more than once every three years on average for protection of freshwater aquatic organisms and their uses to not be affected unacceptably. This should be protective of Lahontan cutthroat trout.

   EPA concludes that the adoption of the chloride beneficial use criteria **may affect, but is not likely to adversely affect** Lahontan cutthroat trout. EPA anticipates that the chloride criteria will provide adequate protection of aquatic life as stated in the 1988 Ambient Water Quality Criteria for Chloride (USEPA, 1988).

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